

The Pauropoda and Symphyla of the Geneva Museum V. A review of the Swiss Scolopendrellidae (Myriapoda, Symphyla)

by

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With 8 figures

ABSTRACT

The present study is a review of the Scolopendrellidae (Myriapoda, Symphyla) of Switzerland, their systematics and zoogeography. It is based mainly upon the Gisin collection in the Natural History Museum, Geneva, but also upon material accumulated in later years.

Seven species are listed. They belong to 4 genera. *Scolopendrellopsis balcanica* (Remy) is reported from Switzerland for the first time.

The composition and distribution of the Swiss species indicate that they are mainly widely distributed. One species seems to be restricted to Central Europe and two species might be in southwestern Palearctic only. In a catalogue of the Swiss species the synonyms are listed.

1. INTRODUCTION

The occurrence in Switzerland of the order Symphyla has long been known but few authors have given their attention to it. However, Herman GISIN in 1949 published in *Archs Sci.* a brief survey of the symphylans then reported. He enumerated 7 species, 5 from Scolopendrellidae and 2 from Scutigereidae. Because new species have been described since that time, partly close to species earlier reported from Switzerland, and because new material has been collected from several localities it is justifiable to prepare a new summary. In consequence the author has now taken the first step in making a fresh taxonomical study of the Scolopendrellidae of the Gisin collection (160 specimens) and included in the actual list that new material which has been accumu-

lated in recent years in the collections of the Natural History Museum, Geneva (100 specimens). The latter has been brought together in the Geneva soil zoology project led by Dr Bernd Hauser, curator of the Arthropoda section of the Museum and by Claude Besuchet and Ivan Löbl.

2. PREVIOUS KNOWLEDGE OF SCOLOPENDRELLIDAE IN SWITZERLAND

The first two species of the order Symphyla were described by Scopoli already in 1763 and by Gervais in 1839, in both cases on material collected not very long away from the borders of Switzerland. In spite of that it was a long time before the group could be included in the Swiss fauna but in 1899 Hans ROTHENBÜHLER mentioned in "Ein Beitrag zur Kenntnis der Myriapodenfauna der Schweiz" in *Revue suisse Zool.* one representative of Scolopendrellidae, *Scolopendrella notacantha* Gervais, and one of Scutigerellidae, *Scutigerella immaculata* (Newport) from Bern. Three years later (in 1902) these two species were also discovered in Valais by Henry FAES who published his finds in "Myriapodes du Valais" in *Revue suisse Zool.* The next species of Scolopendrellidae was reported in the same year by the Danish zoologist H. J. HANSEN in his important contribution to our knowledge of the Symphyla: The Genera and Species of the Order Symphyla. He reported a new species, *Symphylella vulgaris* (Hansen), from seven European localities among them from a wood at Luzern which he had visited in July, 1893.

The Scolopendrellidae finds mentioned above were all accidental and it was not before 1949 a more broadbased study appeared. In this year Herman GISIN, then an assistant in entomology at the Geneva Museum, published "Symphytes de la Suisse" in *Archs Sci.* The underlying material for this first real list of the Swiss Symphyla was brought together by Gisin himself and yielded a great deal of new and valuable information. He stated that three more Scolopendrellidae species were in Switzerland: *Symphylella isabellae* (Grassi), *Scolopendrellopsis subnuda* (Hansen) and *Geophillella pyrenaica* Ribaut. GISIN was also of the opinion that another species should be discovered viz. *Scolopendrellopsis microcolpa* (Muhr). However, it has not but yet GISIN was probably right since it has been collected in the surrounding countries France, Czechoslovakia, Austria, Yugoslavia and Italy. It is very likely that it is in Switzerland too. On the other hand a quite new species has been found in a Swiss cave, *Symphylella major*, which was described by the present author (SCHELLER 1961: 419-423). It was also reported by AELLEN & STRINATI in 1962 and by STRINATI in 1966.

As reflected in the literature the Swiss Scolopendrellidae fauna thus consists of 6 species. To them is added below a rare species collected in Ticino by Dr Hauser, *Scolopendrellopsis balcanica* (Remy).

3. THE GISIN SCOLOPENDRELLIDAE COLLECTION

My earlier description of the Gisin Pauropoda collection (SCHELLER 1976: 4-5) gives a good picture also of the Scolopendrellidae material. So it is here sufficient to deal with a few details only.

It is a most valuable collection because it contains as many as 160 identifiable specimens but also because it is well preserved and labelled with great accuracy. About half of the specimens are mounted on slides in a fluid of unknown composition, perhaps

the one (consisting of lactic acid, glycerol, formaldehyde and with picric acid saturated glycerol) which is described in GISIN's Collembolenfauna Europas (1960: 10-11). The fluid has often began to evaporate and a few specimens have dried up or fused into the surrounding paraffin wax. The rest of the material is preserved in alcohol and is in a good condition.

Most specimens are from the northern canton Basel-Land and the western Genève and Vaud but there are samples also from Bern, Solothurn, Basel-Stadt, Aargau, Schaffhausen, Zürich, Zug, Ticino and Graubünden. Gisin himself was the main collector but there are a few samples from Ticino collected by H. Kern.

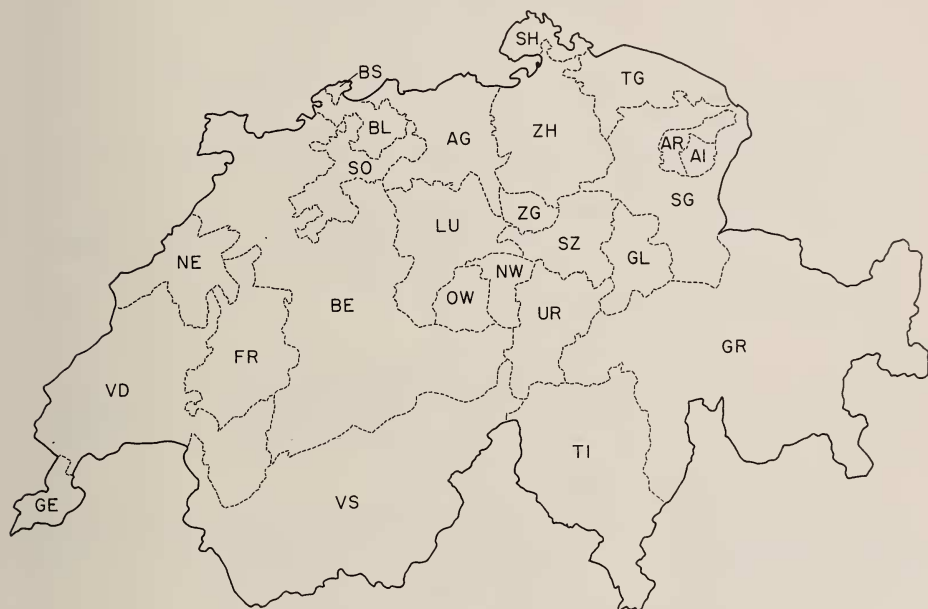


FIG. 1.

Cantons of Switzerland.

A fresh study has now been devoted to all the specimens of this collection. It has shown that Gisin though not a specialist in Symphyla made identifications with a high degree of accuracy. The misidentifications are few in numbers and of little importance and probably due to his limited experience in Symphyla taxonomy.

4. SYSTEMATICS OF SWISS SCOLOPENDRELLIDAE

Key to genera

1. Seventeen tergites or less; tergites usually large and distinct, most often with posterior, triangular processes 2
- Twenty-two tergites; tergites except first one indistinct, represented only by paired oval plaques bearing few setae, no posterior triangular processes *Geophilella*

- 2. First pair of legs vestigial, represented only by small protuberances with a few setae *Symphylella*
- First pair of legs 3-jointed, with claws 3
- 3. Posterior margins of tergites between projections with transverse belts of longitudinal striae. *Scolopendrella*
- Posterior margins of tergites without transverse belts of longitudinal striae *Scolopendrellopsis*

Genus *Symphylella* Silvestri, 1902

Key to species

- 1. First tergite represented by a row of 8-12 setae; cerci densely setose with setae of subequal lengths. 2
- First tergite represented by a row of 6 setae; cerci with a moderate number of setae of different lengths. *vulgaris*
- 2. First leg cup-like; styli conical; tips of posterior processes of anterior tergites broad and blunt *isabellae*
- First leg very short, ring-shaped; styli semiglobular; tips of posterior processes of anterior tergites pointed *major*

1. *Symphylella vulgaris* (Hansen, 1903) (Fig. 2)

Q. Jl Microsc. Sci., n. Ser. 47: 79-81, pl. 6, figs. 6a-d, pl. 7, fig. 1a. Copenhagen.

Material examined. 173 specimens.

Distribution in Switzerland. GENÈVE. Genève, at the Arve, dry grassland, 4 ad. (1 ♀, 3 sex?), 1946-03-31, (Loc. Ga 56, leg. Gisin); same place, 2 subad. 11 (♀♀), 2 juv. 10, 1 juv. 9, 1947-09-28 and 2 ad. (♂♂), 1947-11-23, (Loc. Ga 65, leg. Gisin).

VALAIS. Zaneggen, south slope, grasheath, alt. 1374 m, 1 ad. (♀), 1 subad. 11 (♀), 3 juv. 10, 1945-06-20, (Loc. Hs 41, leg. Gisin).

BERN. Sonvilier, the cave Echelette, alt. 1220 m (SCHELLER 1961: 424; AELLEN & STRINATI 1962: 44; STRINATI 1966: 314).

SOLOTHURN. Gempenweide, beech and spruce forest, alt. 620 m, 2 subad. 11 (♀♀), 1 juv. 9, 3 juv. 8, 1940-08-25, (Loc. Be 22, leg. Gisin). Near Liestal, Munifeld, source-stream of the Rösernbach, in sods, moist meadow, alt. 570 m, 1 ad. (♂), 1941-06-02, (Loc. Be 30, leg. Gisin). W Balsthal, Sonnenberg, northern side, east slope, mixed forest with ferns and moss, *Acanthus* and *Petasites*, under stones in humus on limestone, alt. c. 1230 m, 1 juv. 10, 1 juv. 9, 1941-09-14, (Loc. Cz 10, leg. Gisin); same place, near the top of Sonnenberg, south slope, mixed forest with dog-rose, *Asperula* and *Mercurialis*, alt. c. 1200 m, 1 juv. 10, 1 juv. 9, 1941-09-13, (Loc. Cz 17, leg. Gisin).

BASEL-STADT. Tiefenbrunn, garden soil, 1 ad. (♀), 1942-08-08, (Loc. Ae 236, leg. Gisin); same place, gras and moss, 1 juv. 9, 1 juv. 8, 1942-07-30, (Loc. Ae 237, leg. Gisin).

BASEL-LAND. N Walbach, meadow, loess, alt. c. 320 m, 1 juv. 10, 1942-08-02, (Loc. Ba 21, leg. Gisin); same place, forest, east slope, 2 ad. (♂♂), 1 juv. stad.?, 1942-08-02,

(Loc. Ba 22, leg. Gisin). Basel, Entepreck, under oak, birch and beech, litter, in hard loess, 1 juv. 9, 3 juv. 8, 1942-08-11, (Loc. Ae 246/53, leg. Gisin); same place, *Heracleum* and *Dactylus*, moist loess, 2 juv. 10, 4 juv. 9, 1 juv. 8, 1942-08-16, (Loc. Ae 254/g, leg. Gisin); same place, near Tiefenbrunn, shady place, 2 juv. 10, 4 juv. 9, 1 juv. 8, 1942-08-16, (Loc. Ae 261, leg. Gisin). E Basel, Unterforst, eastern part, spruce forest with *Mercurialis* and *Oxalis*, loose and sandy soil, 1 ad. (♀), 1 juv. 10, 1942-08-02, (Loc. Ba 23, leg. Gisin); same place but with *Carex*, 3 juv. 8, 1942-08-02, (Loc. Ba 24, leg. Gisin). Balsthal-Olten

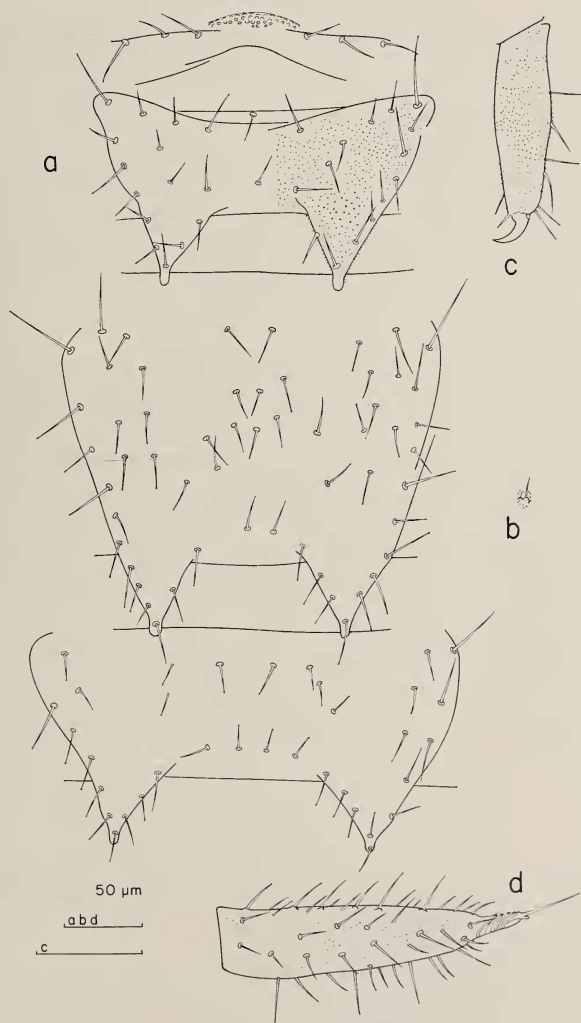


FIG. 2.

Symphylella vulgaris (Hansen).

a) tergites 1-4, dorsal view (pubescence only partially drawn). — b) first leg. — c) tarsus of 12th leg. — d) cercus, outer lateral view.

area, near Bölchenfluh, Rehhag, steep north slope, black, loose, stony humus, alt. c. 900 m, 3 juv. 9, 1940-10-20, (Loc. Cr 17, leg. Gisin).

TICINO. NE Locarno, Minusio, vine plantation, meagre soil, 1 stad.?, 1946-05-26, (Loc. Ht 31, leg. Kern); same place, garden, chestnut stump, in the wood, 1 stad.?, 1946-05-24, (Loc. Ht 27, leg. J. Simonet). Lugano, Bedano, earth slip, gras islet, 1 subad. 11 (♂), 1 juv. 10, 1945-09-21, (Loc. Ht 8, leg. Kern); same place, asparagus field, 1 ad. (♀), 1946-04-16, (Loc. Ht 21, leg. Kern); same place, wild chestnuts, 1 ad. (sex?), 1946-04-16, (Loc. Ht 23, leg. Kern). Lugano, wild chestnut grove, 1 juv. 10, 1 juv. 9, 1945-09-21, (Loc. Ht 10, leg. Kern). Val Mara, at foot of old stump, alt. 800 m, 1 ad. (♂), 1976-04-18, (leg. Besuchet). Val di Muggio, near Scereso, alt. c. 560 m, 1969-06-03, 1 ad. (♂), manual collection, and 1 ad. (♂), 1 subad. 11 (♀), 1 juv. 10, 1 juv. 9, Berlese extraction, (Loc. Te-69/4 and Te-69/17 respectively, leg. Hauser). Bruzella, in leaf litter, Berlese extraction, 1 ad. (♂), 1 subad. 11 (♂), 1969-06-03, (Loc. Te-69/32, leg. Besuchet). Rancate, chestnut stump, flotation and Berlese extraction, 4 ad. (2 ♂♂, 2 ♀♀), 7 subad. 11 (4 ♂♂, 3 ♀♀), 2 juv. 10, 1969-06-05, (Loc. Te-69/34, leg. Besuchet and Löbl). Chiasso, Ressiga, flotation and Berlese extraction, 21 ad. (7 ♂♂, 14 ♀♀), 27 subad. 11 (13 ♂♂, 14 ♀♀), 9 juv. 10, 1969-06-02, (Loc. Te-69/33, leg. Besuchet and Löbl). Morbio Superiore, stump near a brook, flotation and Berlese extraction, 3 ad. (♀♀), 4 subad. 11 (♀♀), 2 juv. 10, 1 juv. 9, 1969-06-06, (Loc. Te-69/35, leg. Besuchet and Löbl).

LUZERN. Luzern (HANSEN 1903: 80).

GRAUBÜNDEN. Ober Engadin valley, Scanfs, meadow, alt. 1680 m, 1 stad.?, 1941 09-27—10-05, (Loc. He 2, leg. Gisin); same place, near Scanfs, Murtiröl, *Erica* and lichen heath, alt. 2430 m, 1 ad. (sex?), 1941-09-27—10-05, (Loc. He 4, leg. Gisin); same place, Scanfs, south slope with dry meagre gras, alt. 1740 m, 5 ad. (4 ♀♀, 1 sex?), 1 juv. 9, 1941-09-28—10-05, (Loc. He 11, leg. Gisin); same place, Scanfs, south slope, dry larch forest, alt. 1740 m, 2 juv. 10, 1941-09-27—10-05, (Loc. He 17, leg. Gisin); same place, on the mountain Griatschouls, meagre alp health with gras and knee wood, alt. c. 2200 m, 3 juv. 8, 1941-10-05, (Loc. He 15, leg. Gisin). Switzerland National Park, Munt la Schera, gras and dry Schera-willow, 2 juv. 10, 1942-07-16—17, (Loc. He 52, leg. Gisin); same place, Fourn and Scarl (GISIN 1949: 185). Grimels, nardetum, alt. 2080 m, 1 juv., 8, 1944-08-25, (Loc. He 104, leg. Gisin). Val del Botsch, among *Ranunculus alpestris*, alt. 2100 m, 1 ad. (♂), 1944-08-25, (Loc. He 107, leg. Gisin).

The specimens from Basel, Entepreck (Ae 254/g), GISIN wrongly referred to *Scolopendrellopsis subnuda*.

General distribution. The species is widely distributed in Switzerland and is so also outside.

EUROPE: Norway, Sweden, Finland, Denmark, Ireland, Great Britain, Germany FRG, Germany GDR, France, Switzerland, Austria, Spain, Italy, Yugoslavia, Albania, Roumania, Greece.

ASIA: India, Sri Lanka, Sumatra, Japan.

AFRICA: Morocco, Algeria, Egypt, Azores, Madeira, Zaire, Angola, Kenya, Tanganyika, Ruanda Urundi, Madagascar, Réunion.

NORTH AMERICA: Mentioned by two authors but the identifications may be questioned.

AUSTRALIA: New Zealand.

2. *Symphylella isabellae* (Grassi, 1886) (Fig. 3)

Mem. r. Accad. Sci. Torino, Ser. 2, 37: 594-596.

Material examined. 5 specimens.

Distribution in Switzerland. BERN. Blauenweide, forest with *Eupteris aquilina* and gras, fern humus, alt. 600 m, 1 subad. 11 (♂), 2 juv. 9, 1942-09-06, (Loc. Ca 64, leg. Gisin).

AARGAU. S Rheinfelden, Olsberg forest, "Auf dem Berg", mixed beech-oak forest, *Impatiens*, leaf litter, alt. 360 m, 2 stad.?, 1941-06-15, (Loc. Bn 14 + 15, leg. Gisin).

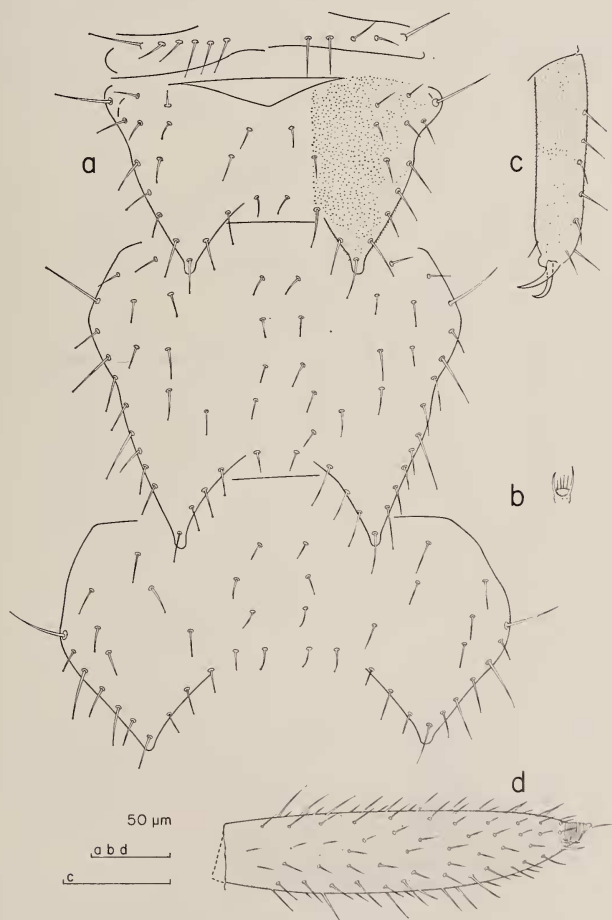


FIG. 3.

Symphylella isabellae (Grassi).

a) tergites 1-4, dorsal view (pubescence only partially drawn). — b) first leg. — c) tarsus of 12th leg. — d) cercus, outer lateral view.

General distribution. Though the species is rare in Switzerland it has a wide distribution.

EUROPE: Norway, Sweden, Great Britain, Germany GDR, France, Switzerland, Austria, Italy, Yugoslavia, Roumania.

AFRICA: Madagascar.

NORTH AMERICA: Mentioned by Hilton but the identifications are dubious.

3. *Symphylella major* Scheller, 1961 (Fig. 4)

Revue suisse Zool. 68: 419-423, fig. 1. Geneva.

Distribution in Switzerland. VAUD. L'Abbaye, the cave La Chaudière d'Enfer, alt. 1070 m, (SCHELLER 1961: 419; AELLEN and STRINATI 1962: 44; STRINATI 1966: 315).

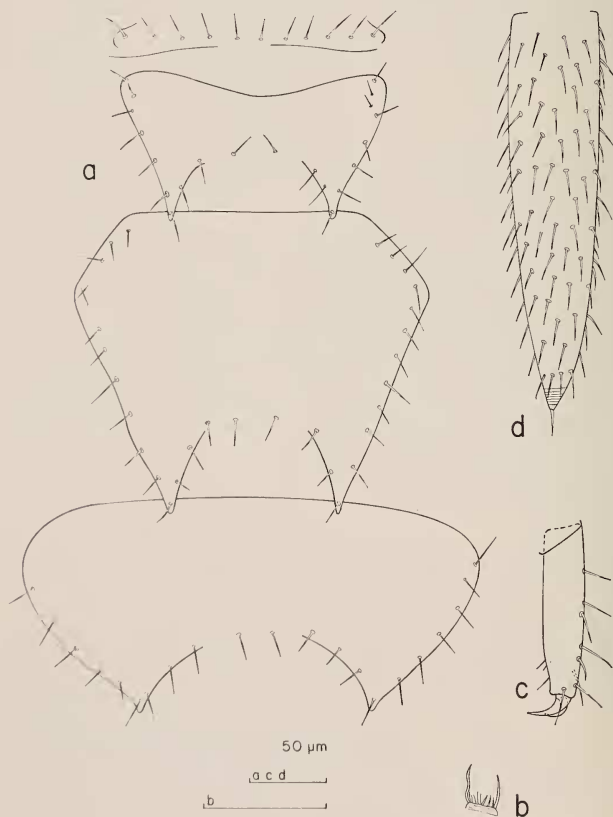


FIG. 4.

Symphylella major Scheller.

a) tergites 1-4, dorsal view. — b) first leg. — c) tarsus of 12th leg. — d) right cercus, dorsal view. (Pubescence not drawn.)

BERN. Simme valley. Oberwil, Zwerglichilchli, alt. 1260 m, (SCHELLER 1968: 127; STRINATI 1966: 314-315).

General distribution. EUROPE: Belgium, Switzerland, Austria.

The species is known from five localities in all. Those from Belgium and Switzerland are from caves and those from Austria from between 2250 and 2400 m a.s.l. in the Alps.

Genus *Scolopendrellopsis* Bagnall, 1913

Key to subgenera

1. Processes of most anterior tergites triangular, as long as or broader than long; usually at least one seta inserted between inner basal and apical setae *Scolopendrellopsis* s. str.
- Processes of most anterior tergites more or less digitiform, longer than broad; usually without setae between inner basal and apical setae . . . *Symphylellopsis*

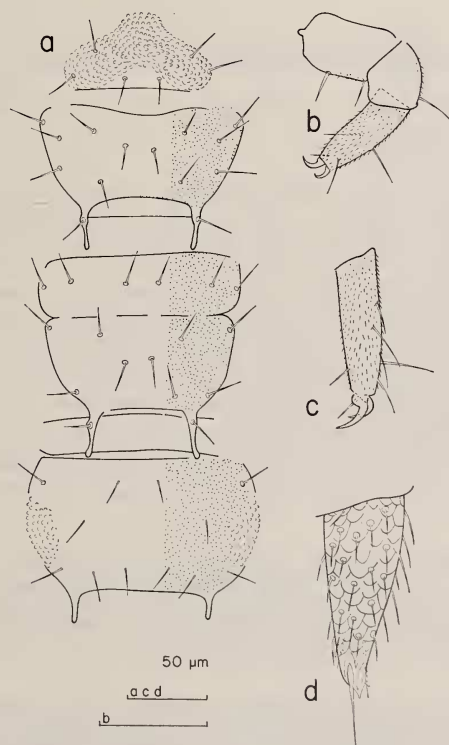


FIG. 5.

Scolopendrellopsis balcanica (Remy).

a) tergites 1-4, dorsal view (pubescence only partially drawn). — b) first leg. — c) tarsus of 12th leg. — d) right cercus, dorsal view.

Subgenus *Symphyloleloopsis* Ribaut, 19314. *Scolopendrelloopsis* (*Sympyleloopsis*) *balcanica* (Remy, 1943) (Fig. 5)

Arch. Zool. exp. gén. 83: 4-6, figs. 1-2. Paris.

Material examined. 1 specimen.

Distribution in Switzerland. TICINO. Monte Generoso, Cragno, alt. c. 940 m, 1 juv. 10 (♀), 1969-06-04, (Loc. Te-69/7, leg. Hauser). — New to Switzerland.

General distribution. EUROPE: France, Switzerland, Spain, Yugoslavia, Roumania, Greece.

AFRICA: Algeria.

Though it is sure that many factors affect the geographic range of a species it is very likely that the temperature is of special importance for this one. It is indicated by the marked southern distribution in France and Switzerland and by the complete absence further north. The species might have a more or less circum-mediterranean range.

5. *Scolopendrelloopsis* (*Symphyloleloopsis*) *subnuda* (Hansen, 1903) (Fig. 6)

Q. Jl Microsc. Sci., n. Ser., 47: 70-72, pl. VI, fig. 2a-g. Copenhagen.

Material examined. 64 specimens.

Distribution in Switzerland. GENÈVE. Genève, Vessy, at the Arve, dry grass-land, 4 ad. (1 ♂, 1 ♀, 2 sex?), 1946-03-31, (Loc. Ga 56, leg. Gisin). Genève, Natural History Museum, garden, 2 ad. (♂♂), 2 juv. 10, 1946-04-03, (Loc. Ga 58, leg. Gisin).

VAUD. Verger, *Rumex*, humide loamy soil, 1 ad. (♀), 1 subad. 11 (sex?), 1 juv. 10, 1943-05-06, (Loc. Gf 17, leg. Gisin); same place and date, 2 ad. (♀, sex?), 1 subad. 11 (♀), 3 juv. 10, (Loc. Gf 18, leg. Gisin). Génolier-Givrin area, forest and slope at the foot of the Jura Mountains, moss on tufa, alt. c. 600 m, 1 juv. 10, 1944-06-25, (Loc. Gc 14, leg. Gisin). Near the castle Echallens, on NW slope of hill, humide sandy soil with *Sambucus*, *Aegopodium* and *Urtica* (Loc. Gf 8) and on WNW slope with gras, *Primula* and moss (Loc. Gf 9), 1 ad. (♀), 2 subad. 11 (♀♀) 1943-04-26, (Leg. Gisin). NW Echallens, forest, near glade, moss, sandy soil, 3 ad. (♀♀), 1943-05-04, (Loc. Gf 13, leg. Gisin).

BASEL-LAND. Basel, Entepreck, *Heracleum* and *Dactylus*, moist loess, 6 ad. (♀♀), 2 subad. 11 (sex?), 7 juv. 8, 1 juv. ? (?) (!), 1942-08-16, (Loc. Ae 254/g, leg. Gisin); same place, near Tiefenbrunn, shady place, 1 subad. 11 (♀), 1 juv. 8, 1 juv. (stad. ?), 1942-08-16, (Loc. Ae 261, leg. Gisin). Near Liestal, Waldacker, 1 juv. 9, 1942-08-02, (Loc. Ba 32, leg. Gisin).

AARGAU. Lake Egel, coniferous forest at Bellikon, sandy soil covered with moss and needles, alt. c. 700 m, 1 ad. (♀), 1943-05-16, (Loc. G1 10, leg. Gisin). At the Reuss, Bremgarten, mixed forest with bilberry and *Carex*, incompletely decomposed humus, 1 juv. 10, 1943-05-16, (Loc. G1 17, leg. Gisin).

SCHAFFHAUSEN. Säkelamtshüsli, forest, glade with young spruces and gras, 3 juv. 10, 1943-09-25, (Loc. Gs 2, leg. Gisin).

ZÜRICH. Near Töss, mixed forest, edge with *Viburnum lantana*, mulberry trees, *Rosa* and *Euphorbia*, dry stony soil, 1 subad. 11 (♀), 1943-06-27, (Loc. Gm 9, leg. Gisin). Near Eich, clearing-glade, young spruces, *Rubus*, *Angelica*, wild strawberry, grass and *Viola*, 1 juv. 10, 1943-07-11, (Loc. Gm 12, leg. Gisin).

ZUG. Oberägeri, meadow, 2 juv. 8, 1942-08-20, (Loc. Hh 3, leg. Gisin).

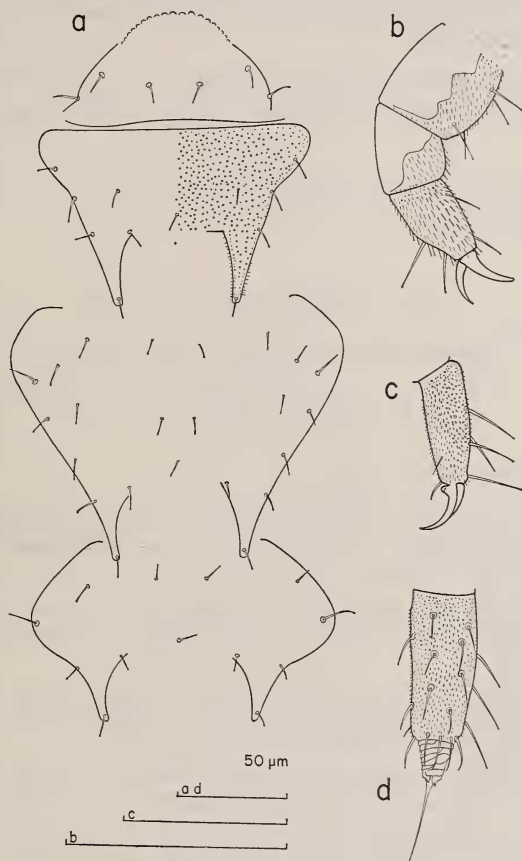


FIG. 6.

Scolopendrellopsis subnuda (Hansen).

a) tergites 1-4, dorsal view (pubescence only partially drawn). — b) first leg. — c) tarsus of 12th leg. — d) right cercus, dorsal view.

TICINO. Bedano, agricultural soil with vine and potatoes, 1 juv. 9, 1945-09-c.21, (Loc. Ht 7, leg. Kern); same place, heath, 1 ad. (♂), 2 subad. 11 (♂, ♀), 1945-09-c.21, (Loc. Ht 16, leg. Kern). Manno, fallow, 1 juv. 10, 1945-09-c.21, (Loc. Ht 22, leg. Kern). Chiasso, Ressiga, flotation and Berlese extraction, 1 ad. (♂), 1969-06-02, (Loc. Te-69/33, leg. Besuchet and Löbl.) Monte Generoso, Bella Vista, sieving of *Asphodelus* roots, Berlese extraction, 3 ad. (1♂, 2♀♀), 2 subad. 11 (♀♀), 1946-06-04, (Loc. Te-69/36, leg. Besuchet and Löbl.).

The above specimen from the Zürich locality near Töss (Loc. Gm 9) was referred to cf. *subnuda* by GISIN and the specimens from Basel, Tiefenbrunn (Loc. Ae 261), to *Symphylella vulgaris*. Moreover, four specimens from Basel, Entepreck (Loc. 254/g) which were identified by GISIN as *S. subnuda* have to be placed in *Symphylella vulgaris* (p. 00).

General distribution. *Scolopendrellopsis subnuda* is one of the most common symphylans in Europe and northwestern Africa. Its occurrence outside this area seems to depend on recent introduction.

EUROPE: Norway, Sweden, Finland, Denmark, Ireland, Great Britain, Germany FRG, Germany GDR, France, Switzerland, Austria, Spain, Italy, Yugoslavia, Roumania, Greece.

AFRICA: Morocco, Algeria, Azores, Madeira, Réunion.

NORTH AMERICA: Hawaii.

Genus *Scolopendrella* Gervais, 1839

6. *Scolopendrella notacantha* Gervais, 1840 (Fig. 7)

C. r. Séanc. Acad. Sci. Paris, 1839, 9: 421, 530-532
and *Revue Zool.* 2: 279-281, 316-317.

Material examined. 10 specimens.

Distribution in Switzerland. GENÈVE. Genève, Corsier, Traimure forest, northern part, *Arum*, *Anemone nemorosa* and *Ranunculus ficaria*, humid clay, 1 ad. (♀), 1 juv. 9, 1949-04-10, (Loc. 232, leg. Gisin).

BERN. Bern, refuse-dump (ROTHENBÜHLER 1899: 210). NE Laufen, Eggberg, common forest, beeches, leaf litter, alt. 650 m, 1 ad. (♀), 1 juv. 10, 1941-03-16—05-04, (Loc. Ca 39, leg. Gisin).

SOLOTHURN. Passwang, meagre health, alt. 930 m (GISIN 1949: 185). No specimen verifying this locality has been found in the Gisin collection.

BASEL-LAND. Basel, Entepreck, oak forest with birch, beech, maple and hazel, leaf litter, hard loess, 1 subad. 11 (♂), 1 juv. 9, 1942-08-11, (Loc. Ae 246/53, leg. Gisin).

AARGAU and SCHAFFHAUSEN. Gisin said (1949: 185) that the species had been collected in these two cantons but verifying specimens have not been found.

ZÜRICH. Between Zürich and Winterthur, Kemptal, Brütten, "Eich", at margin of spruce forest, moss and *Melampyrum*, dark and acid humus, alt. 610 m, 1 subad. 11 (♂), 1943-06-05, (Loc. Gm 2, leg. Gisin).

VALAIS. Near Sierre, Finges (FAES 1902: 52).

TICINO. Monte Generoso, Cragno, alt. c. 940 m, 1 juv. 10, 1969-06-04, (Loc. Te-69/7, leg. Hauser). Near Morbio Superiore, at the Breggia near the cave Demanio, alt. c. 400 m, Berlese extraction, 1 ad. (♂), 1969-06-06, (Loc. Te-69/23, leg. Hauser). Chiasso, Ressiga, flotation and Berlese extraction, 1 subad. 11 (♂), 1969-06-02, (Loc. Te-69/33, leg. Besuchet and Löbl).

GISIN said (1949: 185) that he had the species from 11 localities in the five cantons Basel, Bern, Aargau, Schaffhausen and Zürich. However, in the Gisin collection

there are specimens from three of these only, Bern, Basel-Land and Zürich, but besides there are two specimens from Genève.

General distribution. Though *S. notacantha* is fairly rare in Switzerland it is widely distributed in surrounding countries.

EUROPE: Great Britain, Belgium, Germany FRG, Germany GDR, southern USSR, France, Switzerland, Austria, Roumania, Yugoslavia, Italy, Greece.

AFRICA: Morocco, Algeria.

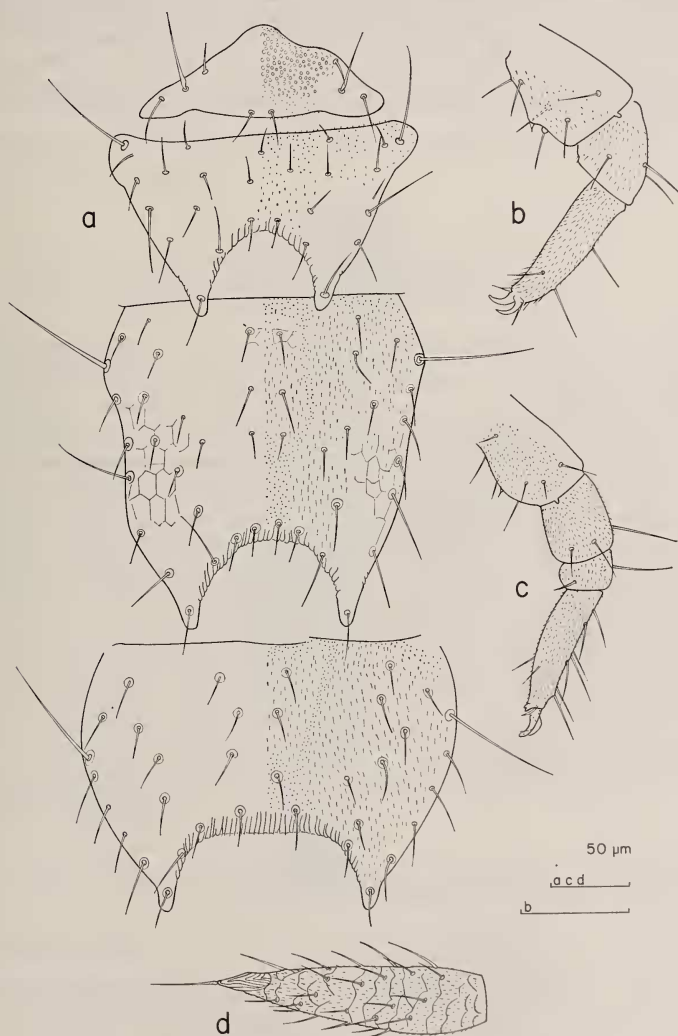


FIG. 7.

Scolopendrella notacantha Gervais.

a) tergites 1-4, dorsal view (pubescence only partially drawn). — b) first leg. — c) 12th leg. — d) cercus, outer lateral view.

Genus *Geophilella* Ribaut, 19137. *Geophilella pyrenaica* Ribaut, 1913 (Fig. 8)

Bull. Soc. Hist. nat. Toulouse, 46: 77-84, figs. 1-6.

Material examined. 7 specimens.

Distribution in Switzerland. GENÈVE. Genève, Vessy, hornbeam and ash forest, 1 stad.?, 1946-04-24, (Loc. Ga 57b, leg. Gisin); same place, grassed ground, 1 juv. 9, 1947-05-26, (Loc. Ga 65, leg. Gisin).

SOLOTHURN. Passwang, meagre heath, alt. 930 m, (GISIN 1949: 185). Verifying specimen not found.

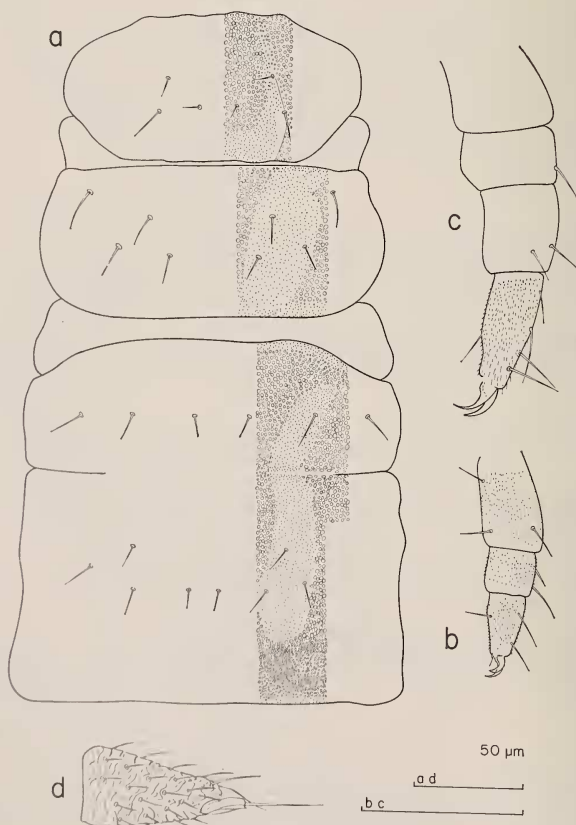


FIG. 8.

Geophilella pyrenaica Ribaut.

a) tergites 1-4, dorsal view. — b) first leg. — c) 12th leg. — d) right cercus, dorsal view.
(Pubescence only partially drawn in a and c).

BASEL-LAND. Near Chrischona, forest on the opposite side of Bettingen, stony ground in limestone quarry, 2 stad.?, 1941-07-05, (Loc. Ee 7, leg. Gisin). Near Tuggingen, at meadow pool on east slope, grassed limestone ground, alt. 930 m, 1 juv. 10, 1941-07-13, (Loc. Cn 20, leg. Gisin).

GISIN mentioned (op. c.: 185) one single specimen from Chrischona from a locality in a forest with *Buxus* and *Ilex*, alt. 460 m. The two specimens from a limestone quarry in the neighbourhood of Chrischona which were reported above might indicate that there were two localities from this area though GISIN specified only one of them.

TICINO. Val di Muggio, near Scereso, alt. c. 560 m, 1 ad. (♀), 1969-06-03, (Loc. Te-69/4, leg. Hauser). Near Morbio Superiore, at the Breggia near the cave Demanio, alt. c. 400 m, Berlese extraction, 1 juv. 9, 1969-06-06, (Loc. Te-69/23, leg. Hauser).

General distribution. The species is restricted to the southwestern Palearctic.

EUROPE: France, Switzerland, Spain, Andorra, Italy, Yugoslavia.

AFRICA: Morocco, Algeria.

5. GENERAL DISTRIBUTION OF THE SWISS SCOLOPENDRELLIDAE

The Scolopendrellidae has 8 known genera. Four of them are in Switzerland and they have 7 species there. Most of them or 5 species are not known outside western Palearctic. The two species which have larger areas are *Symphylella vulgaris*, a subcosmopolite which is the most widely distributed symphylian so far known, and *Scolopendrellopsis subnuda*. They are also the two species most often met with in Switzerland.

The areas of the other species are more restricted but *Symphylella isabellae* and *Scolopendrella notacantha* have both a wide European distribution with localities in many directions outside Switzerland. On the other hand *Scolopendrellopsis balcanica* and *Geophilella pyrenaica* might be restricted to the southern half of Europe and to North Africa with the Swiss localities near their northern dispersal frontiers.

Thus all the Swiss Scolopendrellidae except *Symphylella major* have a more or less wide distribution. The latter species seems to be restricted to a band from Belgium via Switzerland to Austria. This picture of a fauna mainly composed of widely distributed representatives will surely remain unaltered even if at least another two species will probably be discovered, *Scolopendrellopsis microcolpa* (Muhr) and *Symphylella elongata* Scheller. They were both expected because they are known from several European localities outside Switzerland.

6. CATALOGUE OF THE SWISS SCOLOPENDRELLIDAE

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Genus *Symphylella* Silvestri 250

S. vulgaris (Hansen, 1903) 250

Syn.: *Scolopendrella notacantha* Latzel, 1884

Scolopendrella vulgaris Hansen, 1903

? *Scolopendrella pusilla* Hansen, 1903

Symphylella delicatula Bagnall, 1913

<i>Symphylella horrida</i> Bagnall, 1913	
<i>Symphylella minutissima</i> Bagnall, 1913	
<i>Symphylella vulgaris</i> : Bagnall, 1913	
<i>S. isabellae</i> (Grassi, 1886)	253
Syn.: <i>Scolopendrella Isabellae</i> Grassi, 1886	
? <i>Symphylella jacksoni</i> Bagnall, 1913	
<i>Symphylella dunelmensis</i> Bagnall, 1913	
<i>Symphylella Isabellae</i> : Silvestri, 1902	
<i>Symphylella isabellae</i> : Bagnall, 1913	
<i>Scolopendrella isabellae</i> var. <i>dunelmensis</i> Bagnall, 1914	
<i>S. major</i> Scheller, 1961	254
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Subgenus <i>Symphylellopsis</i> Ribaut	256
<i>S. (S.) balcanica</i> (Remy, 1943)	256
<i>S. (S.) subnuda</i> (Hansen, 1903)	256
Syn.: ? <i>Scolopendrella pygmaea</i> Silvestri, 1902	
<i>Scolopendrella subnuda</i> Hansen, 1903; Bagnall, 1914	
<i>Scolopendrellopsis subnuda</i> : Bagnall, 1913	
<i>Symphylellopsis subnuda</i> : Ribaut, 1931	
<i>Scolopendrellopsis (Symphylellopsis) subnuda</i> : Scheller, 1971	
Genus <i>Scolopendrella</i> Gervais	258
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Syn.: ? <i>Geophilus junior</i> Gervais, 1836	
<i>Scolopendrella notacantha</i> Gervais, 1839, 1844 and 1847;	
Grassi, 1886 (non Latzel, 1884)	
<i>Scolopendrella microcolpa</i> from Carus Muhr, 1881	
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<i>G. pyrenaica</i> Ribaut, 1913	260

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<i>jacksoni</i>	262	<i>subnuda</i>	248, 252, 256, 258, 261, 262
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<i>major</i>	248, 250, 254, 261, 262	<i>Symphylellopsis</i>	255, 256, 262
<i>microcolpa</i>	248, 261, 262	<i>vulgaris</i>	248, 250, 261, 262
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ZUSAMMENFASSUNG

Diese Arbeit ist eine Übersicht über die Fauna der Scolopendrellidae (Myriapoda, Symphyla) der Schweiz, ihre Verbreitung und Taxonomie. Sie ist aufgebaut einestails auf einem erneutem Studium und der Revision der Sammlung von Hermann Gisin im Naturhistorischen Museums in Genf und andernteils auf dem Material, das in späteren Jahren obigem Museum von der Arbeitsgruppe der Bodenzooologen in Genf unter Leitung von Dr Bernd Hauser zugeführt worden ist.

Sieben Arten wurden festgestellt, die zu 4 Gattungen gehören. Eine Art ist neu für die Schweiz.

Die Zusammensetzung der Schweizer Fauna der Scolopendrellidae und die Verbreitung der einzelnen Arten deutet darauf hin, dass sie hauptsächlich aus weit verbreiteten Arten besteht. Eine Art scheint auf Mitteleuropa begrenzt zu sein. Zwei Arten könnten südwestpaläarktisch sein.

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